FINAL REPORT

ACQUISITION OF GEOGRAPHIC INFORMATION SYSTEM II

By

U.S. Fish and Wildlife Service
National Coastal Ecosystems Team
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Submitted to

Coastal Management Section
Department of Natural Resources
State of Louisiana

DNR Cooperative Agreement Number 21910-84-03

15 April 1985

Task I - Digitization of Habitat Maps

The U. S. Fish and Wildlife Service (FWS) digitized 168 - 1:24,000 habitat maps for the study. This represents an extra 30 maps beyond that required for the Agreement. A complete listing of maps digitized thus far by FWS may be found in Attachment A.

Data tapes in Map Overlay Statistical System (MOSS) format for installation on the Department of Natural Resources (DNR) computer were delivered in March, per your instructions.

Task II - Database Analysis and Training

For this task, FWS provided technical assistance on an "as needed" basis to DNR personnel during the length of the Agreement. Total number of technical assistance requests was 24. These requests included assistance in permit reviews, computer accession, software clarifications, and training.

Special projects or analyses included computer graphics and data for Barataria Estuarine Conference (Attachment B), Chenier Plain MOSS files converted to ELAS format for Louisiana State University and U. S. Soil Conservation Service (Attachment C), two computer-generated maps (20 total) on wetland changes for selected portions of the Louisiana coastal zone (Attachment D), and a summary paper prepared by FWS on comparison of MOSS and ELAS for monitoring wetland loss (Attachment E).

Training for DNR was provided by FWS on an "as needed" basis and DNR participated in a 1-week MOSS Users' Workshop in Denver, CO, sponsored by the FWS and the Bureau of Land Management, in mid-February. Updated training manuals have been supplied to DNR as they become available.

Task III - Installation of Dedicated Computer Line

Per DNR instructions, the installation of a dedicated line was cancelled due to DNR purchasing their own geographic information system. However, FWS did provide DNR access to its computer on an "as needed" basis and DNR accessed FWS's computer approximately 250 hours during study.

ATTACHMENT A

LOUISIANA 1956 HABITATS

MAP NAME

ABBEVILLE EAST
ABBEVILLE WEST
ALLIGATOR POINT
AMELIA
BARATARIA
BARATARIA PASS
BASTIAN BAY
BAY BATISTE
BAY COQUETTE
BAY COUPANT
BAY DOS GRIS
BAY L'OURS
BAY RONQUILLE
BAY SAUVEUR
BAY TAMBOUR
BAYOU BLANC
BAYOU COCODRIE
BAYOU LABAUVE
BAYOU LUCIEN
BELLE CHASSE
BELLE ISLE
BELLE PASS
BERTRANDVILLE
BLACK BAY NORTH
BLACK BAY SOUTH
BLACK LAKE
BONNET CARRE NE
BOUDREAUX LAKE
BOURG
BRETON ISLANDS
BRETON ISLAND SE
BROWNS LAKE
BURAS
BURRWOOD BAYOU E
BURRWOOD BAYOU W
CALUMET ISLAND
CAMERON
CAMERON FARMS
CAMINADA PASS
CARENCRO BAYOU
CATAHOULA BAY
CATFISH LAKE
CAT ISLAND PASS
CENTERVILLE
CENTRAL ISLE DERNIERES
CHALMETTE
CHANDELEUR LIGHT EAST
CHANDELEUR LIGHT WEST
CHARENTON
CHEF MENTEUR
CHENIERE AU TIGRE NE
CHENIERE AU TIGRE NW
CHENIERE AU TIGRE SE
CHENIERE AU TIGRE SW
COCODRIE
CONSTANCE BAYOU NE
CONSTANCE BAYOU SE
CONSTANCE BAYOU NW

CONVENT
COQUILLE POINT
COVINGTON
COVINGTON SW
CUT OFF
CYPREMORT POINT
DELACROIX
DELCAMBRE
DIXON BAY
DOG LAKE
DONALDSONVILLE
DOOR POINT
DULAC
EAST BAY JUNOP
EAST OF PASS A LOUTRE E
EASTERN ISLES DERNIERES
ELLERSLIE
EMPIRE
FALSE MOUTH BAYOU
FIVE LAKES
FORKED ISLAND NW
FORKED ISLAND SW
FOUR LEAGUE BAYOU
FRANKLIN
GARDEN ISLAND PASS
GOLDEN MEADOW
GOLDEN MEADOW FARMS
GRAND BAYOU
GRAND BAYOU DU LARGE
GRAND CHENIERE
GRAND ISLE
GRAND GOSIER ISL EAST
GRAND GOSIER ISL WEST
GRAND LAKE EAST NE
GRAND LAKE EAST SE
GRAND LAKE EAST NW
GRAND LAKE EAST SW
GREENS BAYOU
HAASWOOD
HACKBERRY
HAHNVILLE
HAMMOCK LAKE
HAPPY JACK
HEBERT LAKE
HOG BAYOU NE
HOG BAYOU NW
HOG BAYOU SE
HOLLY BEACH
HOUMA
HUMPHREYS
INDIAN BEACH
INTRACOASTAL CITY
JACKO BAY
JEANERETTE
JENNINGS SW
JOHNSONS BAYOU
KEMPER
LILLIAN
LABRANCHE
LACOMBE
LAFITTE
LAGAN

LAKE BATOLA
LAKE BULLY CAMP
LAKE CATAOUATCHE E
LAKE CATAOUATCHE W
LAKE CHARLES SE
LAKE CHARLES SW
LAKE CUATRO CABALLO
LAKE ELOI
LAKE EUGENIE
LAKE FELICITY
LAKE LA GRAISSE
LAKE LAURIER
LAKE MECHANT
LAKE MISERE
LAKE PENCHANT
LAKE POINT
LAKE QUITMAN
LAKE SALVE
LAKE TAMBOUR
LAKE THERIOT
LAPLACE
LAROSE
LATANIA LAKE
LEEVILLE
LENA LAGOON
LITTLE WOODS
LOST LAKE
LULING
LUTCHER
MAIN PASS
MALHEUREUX POINT
MANCHAC
MANDEVILLE
MARONE POINT
MARTELLO CASTLE
MINK BAYOU
MITCHELL KEY
MONTEGUT
MORGAN CITY
MORGAN CITY SE
MORGAN CITY SW
MORGAN HARBOR
MOSS LAKE
MOUND POINT
MOUNT AIRY NE
MOUNT AIRY NW
NEW HARBOR ISL EAST
NEW HARBOR/FREEMASON ISL C
NEW IBERIA SOUTH
NEW ORLEANS EAST
NEW ORLEANS WEST
NORTH BEND
NORTH ISLANDS EAST
NORTH ISLANDS WEST
NORTH SHORE
OAK MOUND BAYOU
ORANGE
ORANGEFIELD
OYSTER BAYOU
PASS A LOUTRE NE
PASS A LOUTRE NW
PASS DU BOIS

PATTERSON
PECAN ISLAND NE
PECAN ISLAND SE
PECAN ISLAND NW
PECAN ISLAND SW
PELICAN PASS
PEVETO BEACH
PHOENIX
PILOTTOWN
PLUMB BAYOU
POINT A LA HACHE
POINT AU FER
POINT AU FER NE
POINT AUX MARCHETTES
POINT CHEVREUIL
POINT CHICOT
PONCHATOULA
PONCHATOULA NE
PONCHATOULA SE
PORT ARTHUR SOUTH
PORT SULPHUR
PROCTOR POINT
RIGOLETS
RESERVE
RUDDOCK
SABINE PASS
ST. TAMMANY
SLIDELL
SORRENTO
SOUTH OF BAYOU LABAUVE
SOUTH OF JOHNSONS BAYOU
SOUTH OF POINT AU FER
SOUTH OF SOUTH PASS
SOUTH PASS
SOUTH POINT
SPANISH FORT SE
SPRINGFIELD
STAKE ISLANDS EAST
STAKE ISLANDS WEST
SWEET LAKE
TAYLOR PASS
TEXAS POINT
THREE BAYOU BAY
THREE MILE BAY
TIGRE LAGOON
TIMBALIER ISLAND
TRIUMPH
VENICE
WEEKS
WELSH SE
WELSH SW
WEST OF GREENS BAYOU
WEST OF JOHNSONS BAYOU
WESTERN ISLES DERNIERES
WILKINSON BAY
YSCLOSKEY

La. 1978 Habitats

ABBEVILLE EAST
ABBEVILLE WEST
ALLIGATOR POINT
AMELIA
BARATARIA
BARATARIA PASS
BASTIAN BAY
BAY BATISTE
BAY COQUETTE
BAY COURANT
BAY DOS GRIS
BAY L'OURS
BAY RONQUILLE
BAY TAMBOUR
BAYOU BLANC
BAYOU COCODRIE
BAYOU LABAUVE
BAYOU LUCIEN
BAYOU SAUVEUR
BELLE CHASSE
BELLE ISLE
BELLE PASS
BERTRANDVILLE
BLACK BAY NORTH
BLACK BAY SOUTH
BLACK LAKE
BONNETT CARRE NE
BOUDREAUX LAKE
BOURG
BRETON ISLANDS
BRETON ISLANDS SE
BROWNS LAKE
BURAS
BURRWOOD BAYOU EAST
BURRWOOD BAYOU WEST
CALUMET ISLAND
CAMERON
CAMERON FARMS
CAMINADA PASS
CARENCRO BAYOU
CAT ISLAND PASS
CATAHOULA BAY
CATFISH LAKE
CENTERVILLE
CENTRAL ISLES DERNIERES
CHALMETTE
CHANDELEUR LIGHT EAST
CHANDELEUR LIGHT WEST
CHARENTON
CHEF MENTEUR
CHENIERE AU TIGRE NE
CHENIERE AU TIGRE SE
CHENIERE AU TIGRE SW
COCODRIE
CONSTANCE BAYOU NE
CONSTANCE BAYOU NW
CONSTANCE BAYOU SE
CONSTANCE BAYOU SW
CONVENT
COQUILLE POINT
COVINGTON
COVINGTON SW
CUT OFF

DELACROIX
DELCAMBRE
DIXON BAY
DOG LAKE
DONALDSONVILLE
DOOR POINT
DULAC
EAST BAY JUNOF
EAST OF PASS A LOUTRE EAST
EASTERN ISLES DERNIERES
ELLERSLIE
EMPIRE
ENGLISH LOOKOUT
FALSE MOUTH BAYOU
FIVE LAKES
FORKED ISLAND NW
FORKED ISLAND SE
FORKED ISLAND SW
FOUR LEAGUE BAY
FRANKLIN
GARDEN ISLAND PASS
GOLDEN MEADOW
GOLDEN MEADOW FARMS
GRAND BAYOU
GRAND BAYOU DU LARGE
GRAND CHENIERE
GRAND GOSIER ISL EAST
GRAND GOSIER ISL WEST
GRAND ISLE
GRAND LAKE EAST NE
GRAND LAKE EAST NW
GRAND LAKE EAST SE
GRAND LAKE EAST SW
GRASSY LAKE
GREENS BAYOU
HAASWOOD
HACKBERRY
HAHNVILLE
HAMMOCK LAKE
HAPPY JACK
HEBERT LAKE
HOG BAYOU NE
HOG BAYOU NW
HOG BAYOU SE
HOLLY BEACH
HOUMA
HUMPHREYS
INDIAN BEACH
INTRACOASTAL CITY
JACKL BAY
JEANERETTE
JENNINGS SW
JOHNSONS BAYOU
KEMPER
LABRANCHE
LACOMBE
LAFITTE
LAGAN
LAPLACE
LAROSE
LAKE ATHANASIO
LAKE BATOLA

LAKE CATAOUATCHE WEST
LAKE CHARLES SE
LAKE CHARLES SW
LAKE CUATRO CABALLO
LAKE ELOI
LAKE EUGENIE
LAKE FELICITY
LAKE LAURIER
LAKE LA GRAISSE
LAKE MECHANT
LAKE MISERE
LAKE PENCHANT
LAKE POINT
LAKE QUITMAN
LAKE SALVE
LAKE TAMBOUR
LAKE THERIOT
LATANIA LAKE
LEEVILLE
LENA LAGOON
LITTLE WOODS
LOST LAKE
LULING
LUTCHER
MADISONVILLE
MAIN PASS
MALHEUREUX POINT
MANCHAC
MARONE POINT
MARTELLO CASTLE
MINK BAYOU
MITCHELL KEY
MONTEGUT
MORGAN CITY
MORGAN CITY SE
MORGAN CITY SW
MORGAN HARBOR
MOSS LAKE
MOUND POINT
MOUNT AIRY NE
MOUNT AIRY NW
NAPOLEONVILLE
NAPOLEONVILLE SW
NEW HARBOR ISL EAST
NEW HARBOR/FREEMASON ISL CE
NEW IBERIA SOUTH
NEW ORLEANS EAST
NORTH BEND
NORTH ISLANDS EAST
NORTH ISLANDS WEST
NORTH SHORE
OAK MOUND BAYOU
ORANGE
ORANGEFIELD
OYSTER BAYOU
PASS A LOUTRE EAST
PASS A LOUTRE WEST
PASS DU BOIS
PASS TANTE PHINE
PATTERSON
PECAN ISLAND NE
PECAN ISLAND NW

PELICAN PASS
PEVETO BEACH
PHOENIX
PIERRE PART
PILOTTOWN
PLUMB BAYOU
POINT A LA HACHE
POINT AU FER
POINT AU FER NE
POINT AUX MARCHETTES
POINT CHEVREUIL
POINT CHICOT
PONCHATOULA
PONCHATOULA NE
PONCHATOULA SE
PORT ARTHUR SOUTH
PORT SULPHUR
PROCTOR POINT
RESERVE
RIGOLETS
RUDDOCK
SABINE PASS
ST. TAMMANY
SLIDELL
SORRENTO
SOUTH PASS
SOUTH POINT
SOUTH OF BAYOU LABAUVE
SOUTH OF JOHNSONS BAYOU
SOUTH OF POINT AU FER
SOUTH OF SOUTH PASS
SPANISH FORT SE
STAKE ISLANDS EAST
STAKE ISLANDS WEST
SWEET LAKE
TAYLOR PASS
TEXAS POINT
THREE BAYOU BAY
THREE MILE BAY
TIGRE LAGOON
TIMBALIER ISLAND
TRIUMPH
VENICE
WEEKS
WELSH SE
WELSH SW
WEST OF GREENS BAYOU
WEST OF JOHNSONS BAYOU
WESTERN ISLES DERNIERES
WILKINSON BAY
YSCLOSKEY

ATTACHMENT B

USING A GEOGRAPHIC INFORMATION SYSTEM TO EVALUATE WETLAND LOSSES IN BARATARIA BAY

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Presented at:

Barataria Estuarine Complex Conference
The Four Columns
3711 West Bank Expressway
Harvey, LA

September 26, 1984

OPENING REMARKS - INTRODUCTION

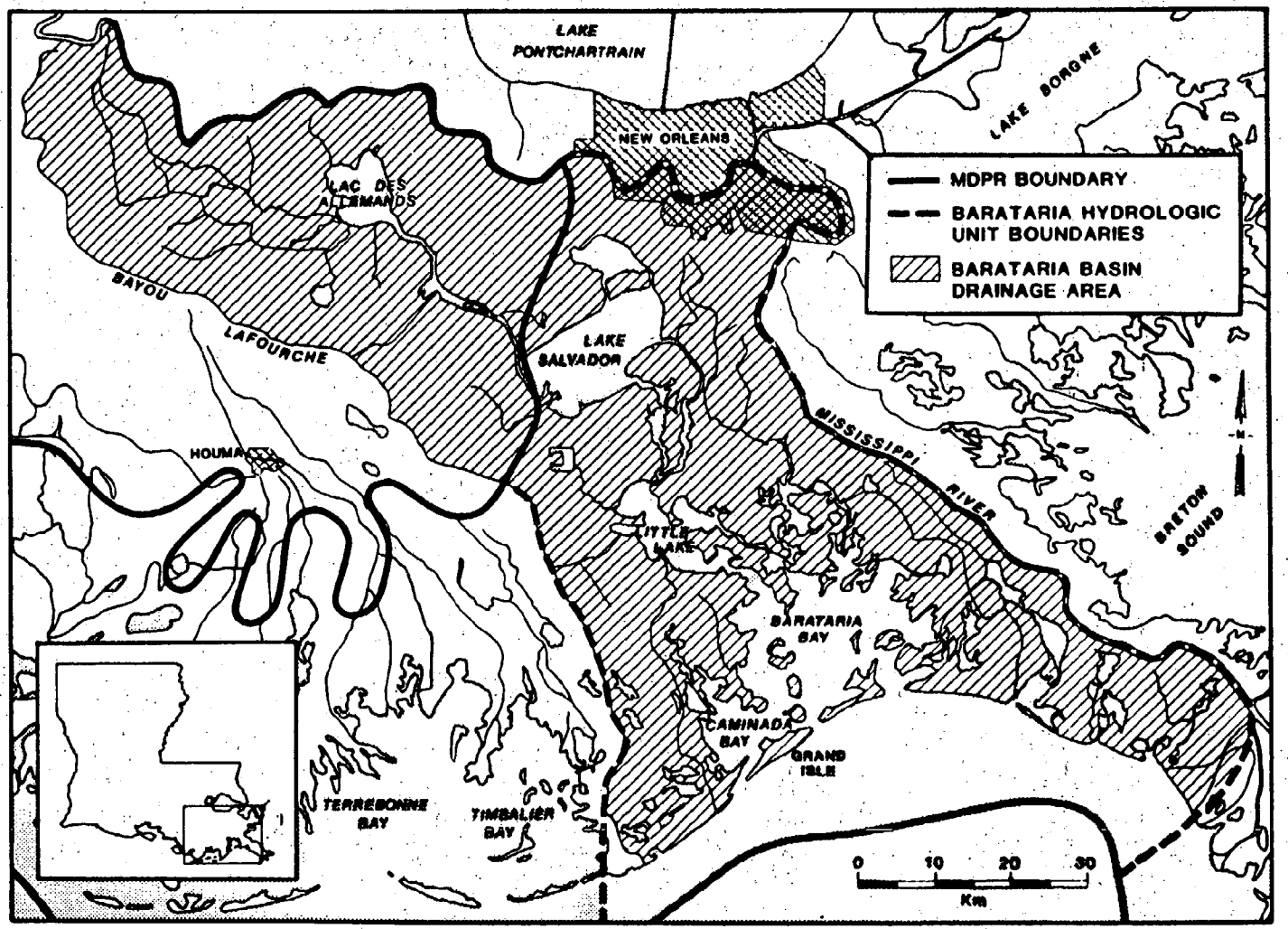
Thank you Dr. Guey. I am very pleased to be here today as a participant in these proceedings. As many of you know, I work for the National Coastal Ecosystems Team, or NCET, of the U.S. Fish and Wildlife Service (FWS) in Slidell, LA. Part of my work involves overseeing the use of a computerized Geographic Information System, or GIS, which we utilize in the analysis of resource management problems throughout coastal areas of the United States. This GIS system is capable of processing large volumes of natural resource and land use information in formats and displays which are extremely useful to resource managers. My presentation this morning will briefly discuss one application of this technology towards the problem of wetland loss in Barataria Bay.

BACKGROUND

Barataria Bay is located along the south central coast of Louisiana (Figure 1). The basin which forms the Bay is a Mississippi Delta flank depression approximately 70 miles long with its apex at Donaldsonville. It widens to approximately 30 miles between Belle Pass at Bayou Lafourche and Red Pass at the Mississippi River. The basin forms a natural mixing area for saline and freshwater and represents an extremely productive natural area with a rich diversity of flora and fauna. The landforms and marshes of the Barataria Basin are in a constant state of flux. Historically, there has been a dynamic equilibrium along the ocean/land interface in coastal Louisiana where relationships between river deposition, waves, currents, subsidence and worldwide sea level changes have resulted in a constantly changing shoreline. In the past, as the Mississippi River wandered from one delta to another, abandoned

Figure 1

MAP OF BARATARIA DRAINAGE BASIN SHOWING THE MDPR BOUNDARY.



deltas and marsh areas slowly eroded as new marshes were established elsewhere. Maintenance of marsh areas was, and continues to be, highly dependent upon the availability of sediments and nutrients either from minor distributaries or from overbank flooding during periods of high water.

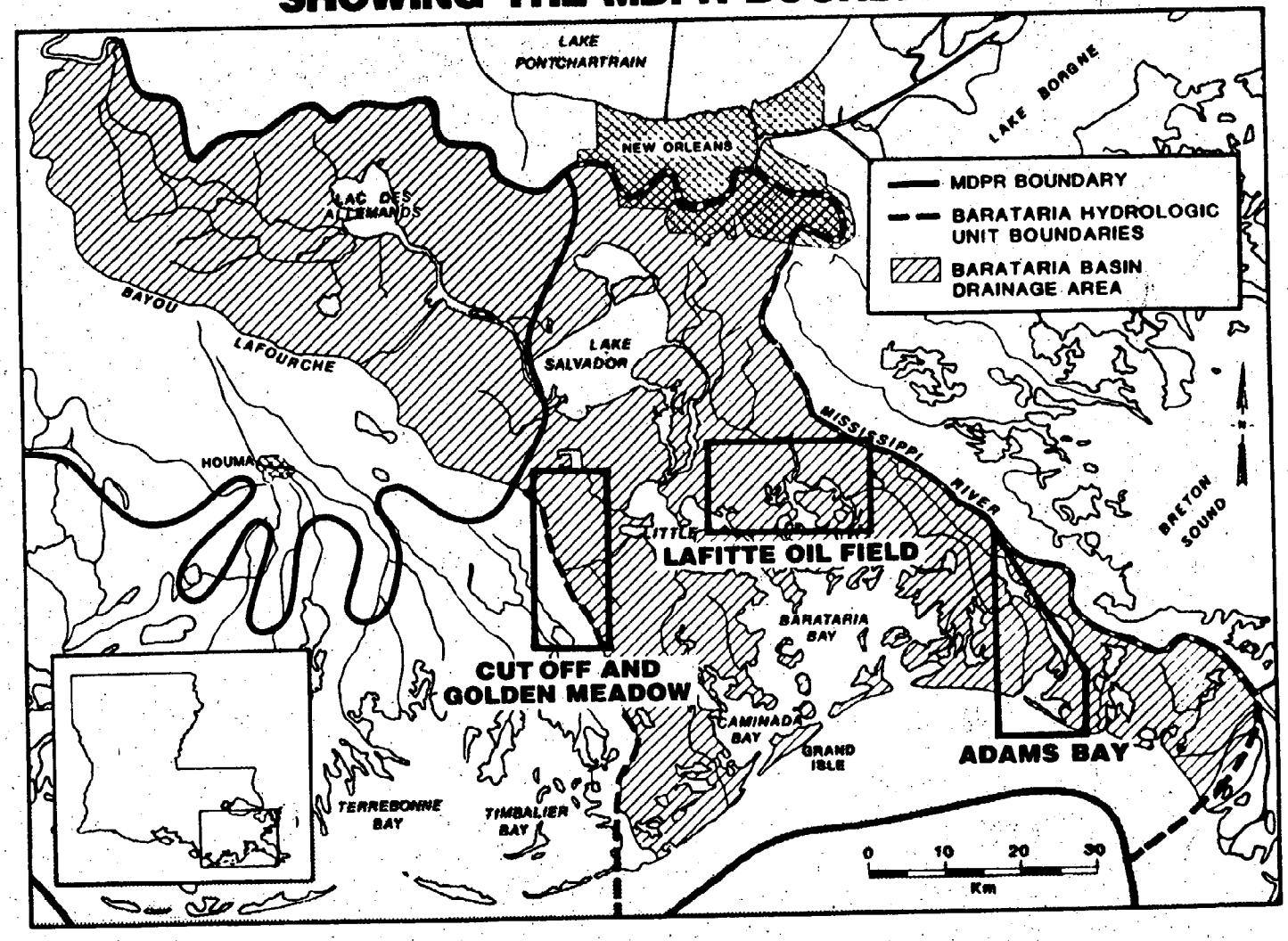
Human activity in Barataria Bay, which has intensified over the past two decades, has greatly modified these processes. The construction of flood control levees along the Mississippi River to the east of the Bay and along Bayou Lafourche to the west was begun during the late 1800's and completed by the 1930's. These levees, combined with the artificial damming of Bayou Lafourche in 1904, effectively cut off all riverborne sediment and freshwater flow into the basin. Today the primary source of freshwater into the area is rainfall. Other activities which impact on wetland loss in Barataria Bay include canal dredging associated with oil and gas activity and marsh drainage for agriculture and urbanization.

DESIGNATION OF PROBLEM AREAS

The GIS system at NCET can be a valuable tool in identifying particular problem areas within Barataria Bay. Although only a portion of the resource information for the entire Barataria Basin has been "digitized," or incorporated into the GIS system (the broken line in Figure 2 roughly approximates the area digitized), we have identified three different problem areas in order to illustrate three different types of land loss within the Bay.

Figure 2

MAP OF BARATARIA DRAINAGE BASIN SHOWING THE MDPR BOUNDARY.



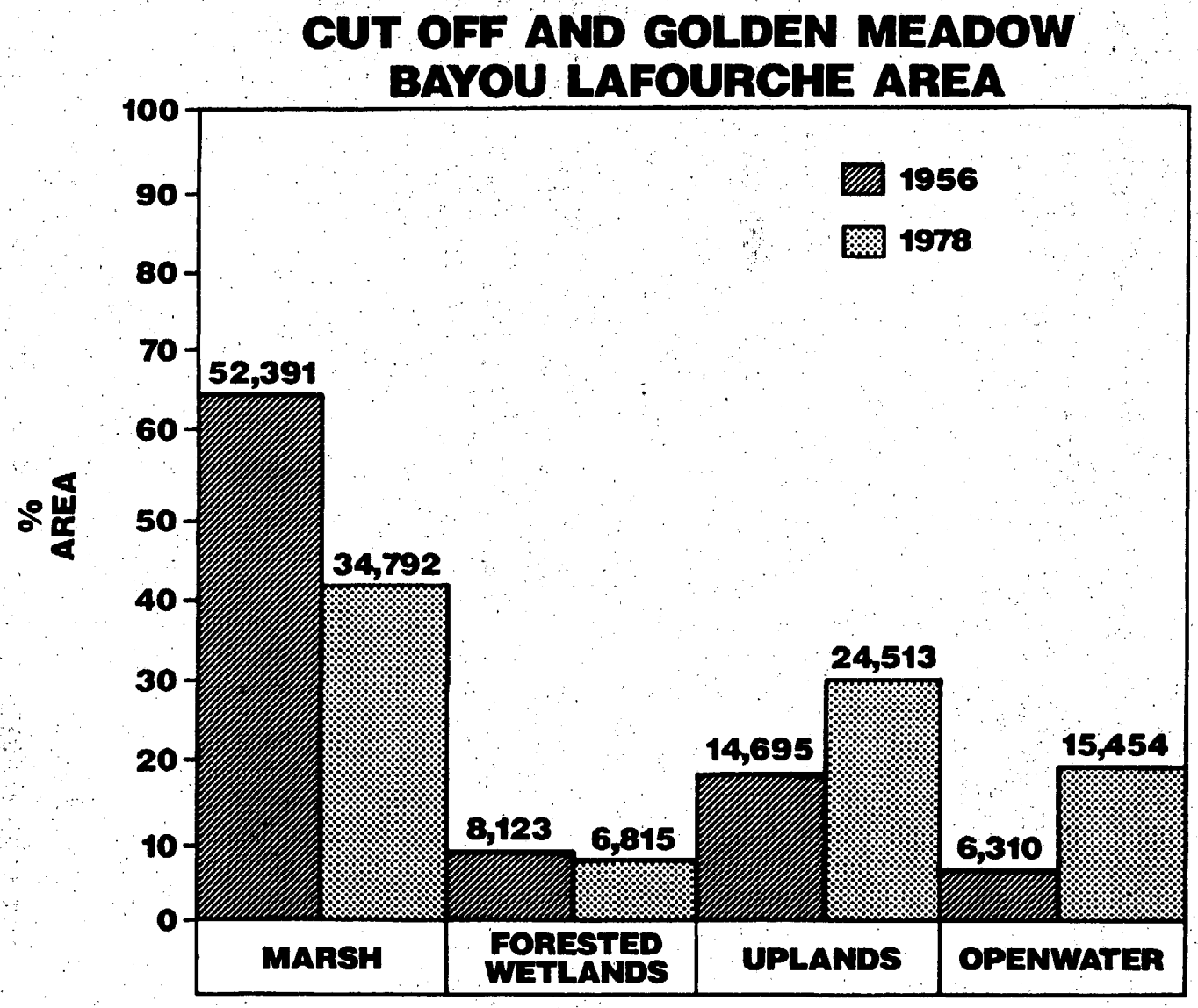
The maps and statistics generated within the GIS system for these areas are based upon wetland habitat maps from two different time periods, 1956 and 1978. For the 1956 maps, black and white aerial photography was interpreted and 1:24,000 scale maps prepared. Color infrared photography was used to prepare the same scale size habitat maps for 1978. These maps were then "digitized," or transferred from point locations on a mapped graphic image, to a computer coordinate system, for digital processing. Wetland habitats were designated according to a wetland classification scheme developed by the FWS.

Cut Off-Golden Meadow Area

The Cut Off-Golden Meadow area is located on the western side of the Barataria Basin along Bayou Lafourche. The most dramatic changes which have occurred in this area has been the loss of marsh to upland development, primarily for agriculture (soybeans and crawfish farming) and also to open water. The bar chart in Figure 3 illustrates the changes over time for four different habitats; marsh, forested wetlands, uplands and open water. The actual data in the GIS system is more specific than this, but for the purposes of our presentation today, the more general relationships between these four categories over time provides the best illustration of change.

Upland change is concentrated around Bayou Lafourche. Various farming operations, including stepped up crawfish farming, have had the largest impact. The construction of a hurricane protection levee system, scheduled to be completed in the near future, will most likely cause even more marsh to disapear. Deterioration of wetland areas to open water has occurred to the south and west of Bayou Lafourche, and around Catfish Lake.

Figure 3


CUT OFF AND GOLDEN MEADOW
BAYOU LAFOURCHE AREA
% AREA
100
90
80
70
60
50
40
30
20
10
0
1956
1978
52,391
34,792
8,123
6,815
14,695
24,513
6,310
15,454
MARSH
FORESTED WETLANDS
UPLANDS
OPENWATER

Lafitte Oil Field

The Lafitte Oil Field is concentrated in central Barataria Bay, northeast of Little Lake and the Cut Off-Golden Meadow area. This region has been subjected to intensive oil and gas exploration as evidenced by the density of canals, the trademark of this industry on the marsh.

Since 1956, as illustrated in Figure 4, approximately 21 percent of the marsh in this area has been changed to open water and uplands. The almost exclusive source of these changes has been the dredging of marsh to provide access canals for drilling rigs, and the deposition of dredge spoil along the canal margins, covering marsh and creating an upland area where there once was none.

Adams Bay

The Adams Bay area is located in the southeastern part of the Barataria Basin between the Gulf of Mexico and the Mississippi River. This area is traversed by numerous oil and gas pipeline canals but has not been subjected to the same level of hydrocarbon exploration as the Laffite Oil Field.

Since 1956, nearly 34 percent of the marsh has deteriorated to open water in this area (Figure 5). Forested wetlands and uplands, concentrated around the Mississippi River, have remained almost unchanged. The most probable cause of land loss in this region is a combination of wave and tidal erosion due to its proximity to the Gulf of Mexico, and a lack of new sediments to replace those that are lost to erosion and local subsidence as former deposits begin to settle. The historical source of new sediments was overbank flooding from the Mississippi.

Figure 4

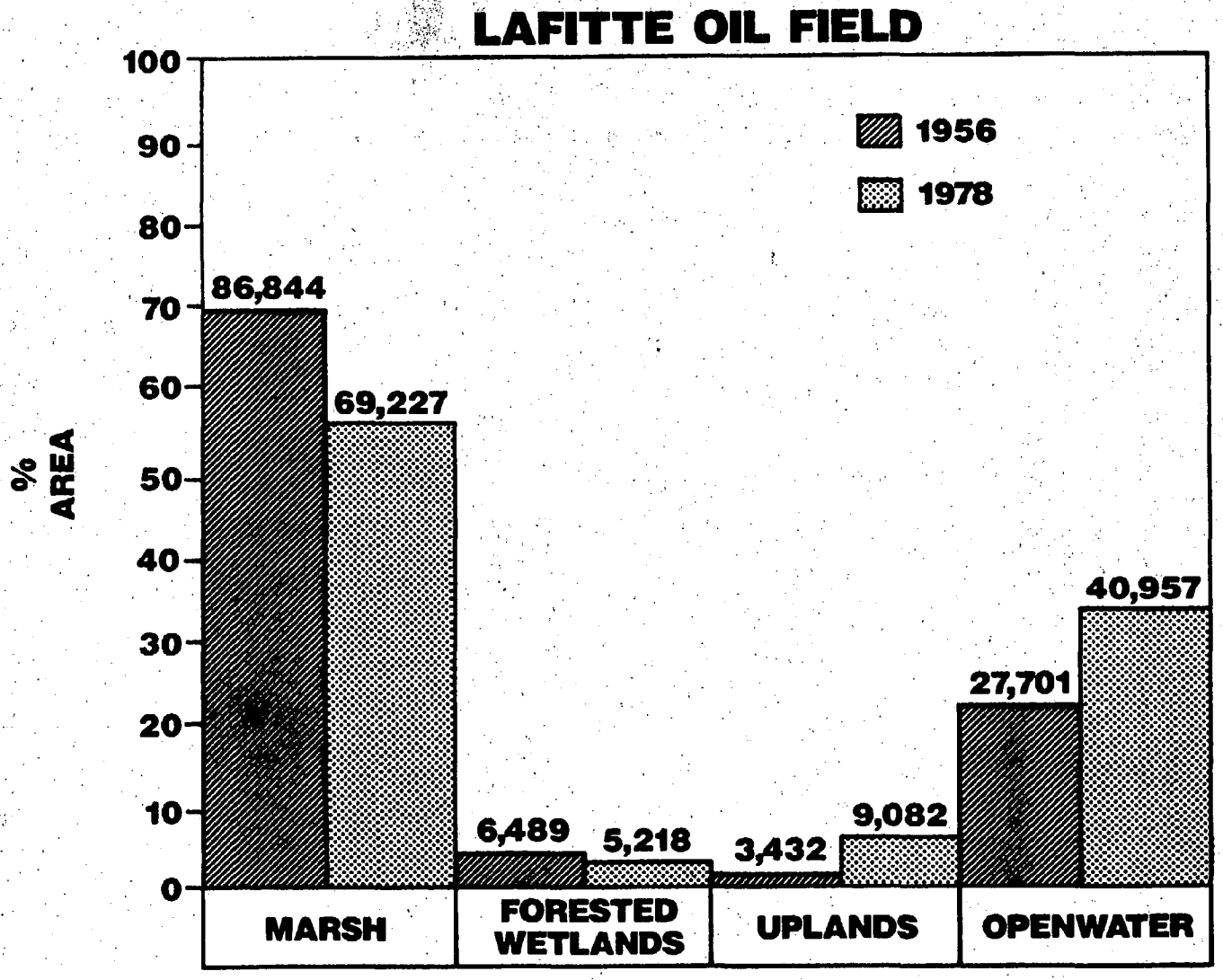
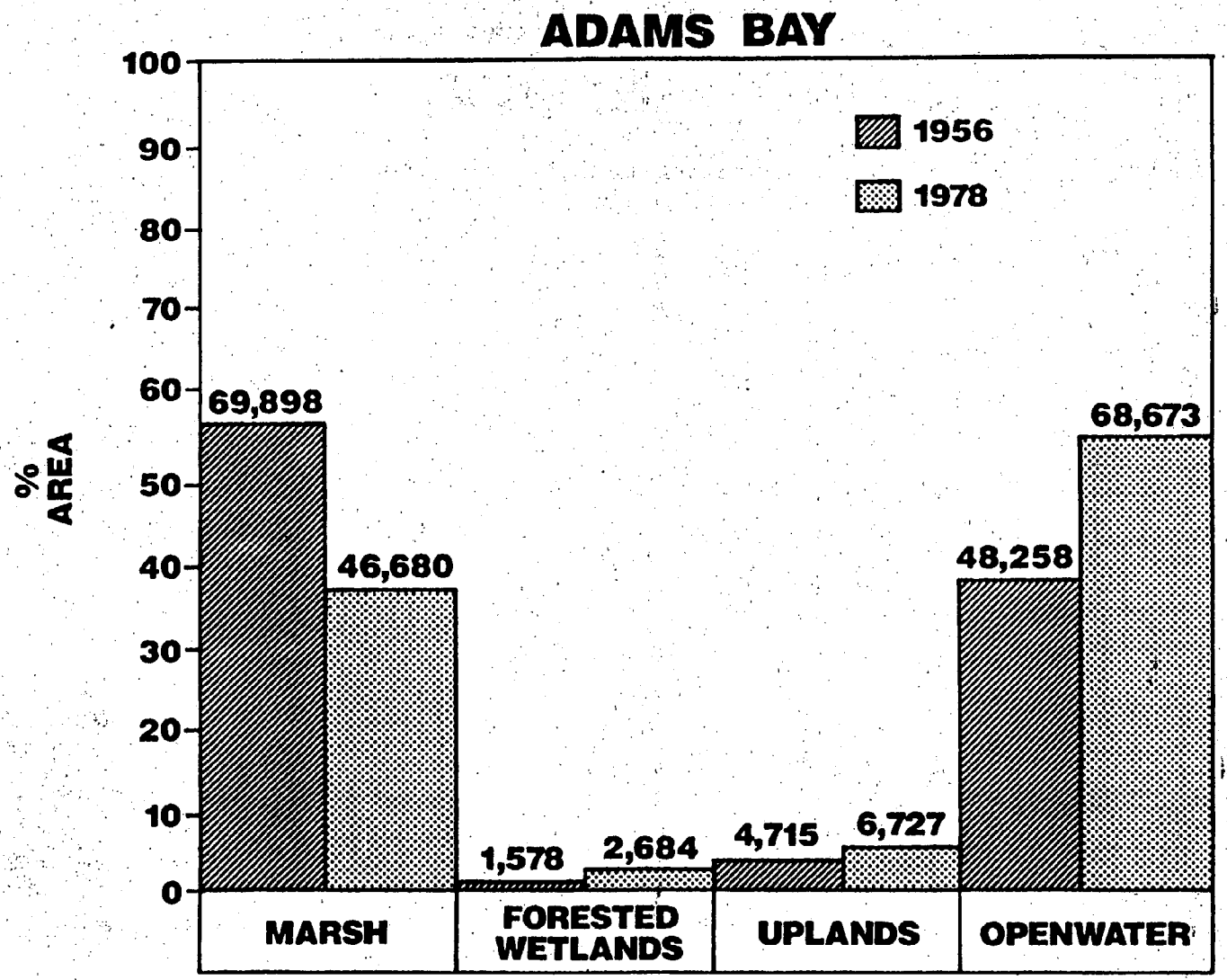

LAFITTE OIL FIELD
1956
1978
% AREA
100
90
80
70
60
50
40
30
20
10
0
86,844
69,227
6,489
5,218
3,432
9,082
27,701
40,957
MARSH
FORESTED WETLANDS
UPLANDS
OPENWATER

Figure 5


ADAMS BAY
1956
1978
% AREA
100
90
80
70
60
50
40
30
20
10
0
69,898
46,680
1,578
2,684
4,715
6,727
48,258
68,673
MARSH
FORESTED WETLANDS
UPLANDS
OPENWATER

Barataria Bay

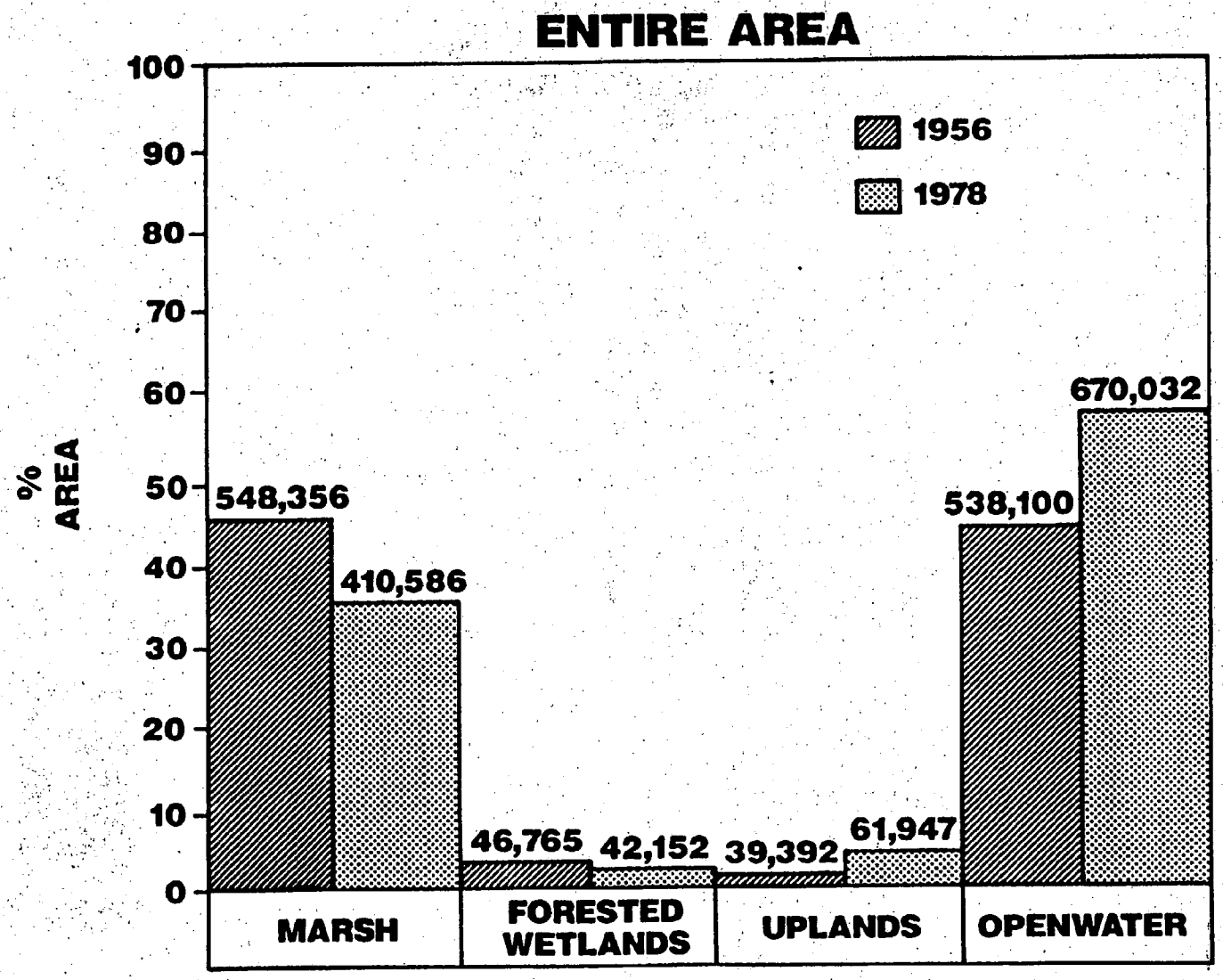
While the three problem areas discussed so far all illustrate significant changes in habitat over time, particularly for wetlands, statistics for the entire area of Barataria Bay (i.e., the area digitized in the GIS) are somewhat less dramatic (Figure 6). Rates of change that were magnified at Adams Bay or Lafitte are not as obvious when one looks across the entire Barataria complex.

Nevertheless, the trend is the same: wetlands are disappearing and being replaced by uplands and open water. Since 1956 marsh, as a percent of the total area, has decreased by 12 percent while open water has increased by 11 percent. The usefulness in locating particular problem areas, such as Adams Bay, is in the application of solutions. By identifying where the most pronounced changes are occurring, we can address the problem more directly and efficiently. Management plans can focus on isolated trouble spots rather than being diluted across vast areas and planning for the future can be more effective.

DISCUSSION

Attributing changes in Louisiana's coastal habitats to man is simple in cases such as the Cut Off-Golden Meadow area where farmers have diked and drained many acres of marsh, and in the Lafitte Oil Field where oil and gas companies have dredged miles of access canals for exploration and production. Such conclusions are not as easily arrived at in the case of Adams Bay or Barataria Bay generally where there are many natural processes at work which may or may not be contributed to by human activities. Dozens of various factors must, in each case, be weighed and considered before the issue of wetland loss can be adequately resolved. Even more difficult to assess is the effect these factors will ultimately have on the Louisiana coast in general, and Barataria Bay in particular, in terms of resource productivity. Finally,

Figure 6


ENTIRE AREA
1956
1978
% AREA
100
90
80
70
60
50
40
30
20
10
0
548,356
410,586
46,765
42,152
39,392
61,947
538,100
670,032
MARSH
FORESTED WETLANDS
UPLANDS
OPENWATER

further confounding the issue, is the question of what we could or even should do to effect changes if we understood wetland loss as having an unquestionably negative impact on natural resources, given the enormous economic costs such action may involve.

My presentation to you this morning does not propose to answer such questions. The landscape of Barataria Bay is certainly changing, of that there can be no question at all. What I hope you will take away from this presentation is a feel for the types of changes that are taking place and how we can use technology available today to study these changes.

CONCLUSIONS - CLOSING REMARKS

I would like to end this presentation by recommending to you that computer-assisted methodologies and techniques can be successfully integrated into comprehensive natural resource planning. The GIS system at NCET is only one example of how this can be done. A GIS system can be an extremely useful tool in planning our future management of the natural resources of Barataria Bay. It can be used not only to better quantify and display existing coastal problems, but also to predict and plan for future ones. The only limits such a system has are the quality of information it receives (which, of course boils down to dollars) and one's own imagination.

Thank you for inviting me to speak to you today. I would now like to try and answer any questions you may have.

ACKNOWLEDGMENTS

The authors thank the following individuals for their contribution to this paper: Bo Blackmon, State of Louisiana; Dave Frugé, Dave Soileau, and Jim Scurry, U.S. Fish and Wildlife Service; Robert Ader, Bureau of Land Management; and John Day and James Gosselink, Louisiana State University. Funding for this effort was provided by the State of Louisiana-Coastal Management Section, Environmental Protection Agency, Minerals Management Service, and U.S. Fish and Wildlife Service.

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ATTACHMENT C

United States Department of the Interior

FISH AND WILDLIFE SERVICE
NATIONAL COASTAL ECOSYSTEMS TEAM
NASA - SLIDELL COMPUTER COMPLEX
1010 GAUSE BOULEVARD
SLIDELL, LOUISIANA 70458

March 15, 1985

Dr. Terry Howey
State of Louisiana
Department of Natural Resources
Natural Resources Building
P.O. Box 44396
Baton Rouge, LA 70804

Dear Dr. Howey:

Enclosed are the data files for the Chenier Plain project requested by your agency. The project area included the Sweet Lake, Boudreaux Lake, Grand Bayou, Hackberry, Cameron, and Creole quadrangles in Louisiana. These maps were merged together and gridded at a 10 meter cell size. The files have been converted to ELAS format and should be read in using the output format in the MOSS2ELAS subroutine. It was necessary to convert the files because of a new cell data format in the MOSS system. The data was dumped as follows:

Tape No. 1

File #1 includes 1956 Wetland Habitats for the project area Block size= 7252

Tape No. 2

File #2 includes 1978 Wetland Habitats for the project area Block size= 7252

A listing of the subjects for each file have been enclosed which specify the habitat type with its associated cell count value. If you have any questions concerning these files please call me.

Sincerely yours,

Floyd Stayner
Geographer

FOS/Enclosures

ATTACHMENT D

United States Department of the Interior

FISH AND WILDLIFE SERVICE
NATIONAL COASTAL ECOSYSTEMS TEAM
NASA - SLIDELL COMPUTER COMPLEX
1010 GAUSE BOULEVARD
SLIDELL, LOUISIANA 70458

January 11, 1985

Dr. Terry Howey
Department of Natural Resources
Coastal Zone Management Section
Natural Resources Building
P.O. Box 44396
Baton Rouge, LA 70804

Dear Dr. Howey:

Per your request of 19 December 1985, I have enclosed two copies of all projects we have completed in the State of Louisiana. These maps partially fulfill our obligations for deliverable items as outlined in Task 2 of the DNR Cooperative Agreement No. 21910-84-03.

If you have any questions pertaining to these items please contact me.

Sincerely yours,

Floyd Stayner
Geographer

Enclosures

ATTACHMENT E

AN EVALUATION OF LANDSAT MSS DIGITAL DATA FOR UPDATING HABITAT MAPS OF THE LOUISIANA COASTAL ZONE

Computerized Geographic Information Systems (GIS) can provide data on the spatial distribution, identity, and condition of natural resources. The National Coastal Ecosystems Team (NCET) currently operates a GIS called Map Overlay and Statistical System (MOSS), which provides data and analyses of coastal zone resources to aid in management decisions. The utility of any GIS used for coastal management is enhanced by periodic updates of the coastal resources data base. Unfortunately, the process of updating coastal habitat maps (i.e., acquisition of aerial photography and collateral data, photointerpretation, digitization, editing, and verification) is often time-consuming and costly. The synoptic and temporal view of the coastal zone offered by satellite remote sensing coupled with computer-processing techniques appeared to have the potential for low-cost updating of habitat maps in the MOSS data base. A study was initiated by NCET to determine the feasibility of using Landsat Multispectral Scanner (MSS) digital data and computer-assisted image processing techniques to update habitat maps of the Louisiana Coastal Zone.

The study area was a 16,845-ha section of coastal lowland in southeast Louisiana. Its boundary was defined by the area encompassed by the Barataria Pass U.S. Geological Survey 7.5-minute topographic quadrangle. Land cover and land use in this area are similar to other coastal regions of the northern Gulf of Mexico and include open water, barrier islands, beaches, coastal vegetation, urban commercial-industrial centers, recreation areas, and oil and gas exploration.

The habitat information stored in the MOSS data base for Barataria Pass quadrangle was digitized from maps produced from manual interpretations of aerial photography taken in 1978. A total of 14 habitat categories were identified and delineated.

A cloud-free 1979 Landsat digital image was selected for the analysis and was processed with a minicomputer equipped for image analysis. This computer used software developed by the National Aeronautics and Space Administration (NASA) for processing digital data from satellite remote sensors. A statistical clustering procedure was used to classify the Landsat data in an attempt to duplicate the 14 habitat categories present in the 1978 MOSS map.

The overall accuracy of the habitat map derived from the Landsat classification was low. While the mapping accuracy for open water habitat was 95.5%, mapping accuracies for the remaining 13 habitat categories ranged from 0.0 to 34.0%. The low mapping accuracies obtained in this study are related to: (1) inadequate spatial and spectral resolution of the Landsat MSS for mapping coastal wetland habitats, (2) differences in tidal levels between the habitat map and Landsat image, (3) radiometric defects in the Landsat (polygon) image, and (4) mapping errors related to the conversion of the MOSS map from vector format into 50-m grid cells. The results of the analysis suggested that machine classifications of Landsat MSS data were not sufficiently accurate for updating habitat maps of the Louisiana coastal zone.

Landsat Thematic Mapper (TM) data, available since mid-1982, offers greatly improved spatial and spectral resolution relative to the MSS image used in this study. The use of these Landsat TM images with manual interpretation

methods would probably result in higher mapping accuracies for coastal habitats.

NCET is continuing its efforts to use remotely-sensed satellite data and computer processing techniques to inventory and monitor coastal resources.

For more information contact:

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National Marine Fisheries Service
National Oceanic and Atmospheric Administration
National Space Technology Laboratories
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FTS 494-3650

and

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U.S. Fish and Wildlife Service
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